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Role of Fossil and Renewable Fuels in the Future Ukraine Energy System

Issues of energy security of Ukraine were discussed as one of the key conditions for the stable existence and economic growth of our independent state. The available resource potential can fully meet the needs of Ukraine in the event of an urgent increase in the resource base of fossil and renewable fuels.

An important place in the energy sector of a number of countries, especially the European Union, is renewable energy sources. Ukraine has significant potential for the development of renewable energy, the main promising directions should be the development of bioenergy, solar energy and the use of the hydropotential of small rivers in Ukraine.

In recent years, energy systems in most countries around the world are approaching a major crisis. Safety issues are associated with the depletion of natural resources, primarily energy, the control of their production and transportation routes. The global pursuit of energy independence, environmental friendliness, and global price volatility force each country to choose its unique way, given its own resources and historical experience.

Natural gas is still one of the most attractive types of fuels in many countries in the electricity generation and industry sectors, since its consumption is rather environmentally friendly.

Ukraine's energy strategy implies a significant increase in domestic production. One of the key issues is to ensure a regular increase in hydrocarbon reserves, which would not only cover the amount of raw materials extracted in Ukraine but also create a certain reserve for the future. In order to significantly and rapidly increase oil and gas production in Ukraine, it is necessary to open large and significant reserves (over 30 million tons of equivalent fuel) of deposits at great depths and underdeveloped territories. Particularly acute today is the question of extraction of hydrocarbons from non-traditional deposits, in particular gas of sealed rocks, shale gas, gas-methane coal deposits, shale oil and gas hydrates. The projected resources of these non-traditional hydrocarbons in Ukraine are: shale gas 1-1.5 trillion m³, gas of dense rocks in the western region -1-2 trillion m³, in the eastern region - 3-8.5 trillion m³, total resources of coal mine methane - 1.8-12 trillion m³, gas resources of the deep sea part of the Black Sea shelf - 4-13 trillion m³, projected resources of hydrated gas in the Ukrainian sector of the Black Sea - 7 trillion m³.

The consumption of a huge amount of energy in the United States led to the rapid development of technologies, which allowed the country not only to satisfy its domestic market, but also gradually become a very influential exporter, mainly due to the extraction of hydrocarbons, especially in shale deposits.

Renewable energy sources (RES) cease to be alternatives. So far, their share in the world is about 15%. Among the countries that are the most intensively developing technologies and markets RES is SPED, the EU countries (first of all, Sweden,

Austria, Finland, Germany, Portugal, Spain), Japan, China. According to the EU Directive on stimulation of RES, it is foreseen a mandatory increase in the share of alternative energy sources in electricity generation up to 20%. State support is the basis for the implementation of renewable energy development programs. Ukraine has significant potential for renewable energy development - all regions of the country have the potential to use RES. Among the priorities are bioenergy, wind turbine, small hydropower, solar and geothermal power, which today have real chances to successfully develop.

Such bioenergy resources as forest wastes, agriculture, household waste, specially cultivated biomass (rape) in Ukraine are widespread. they can be used both for direct burning and for the production of biogas, biodiesel, bioethanol, solid fuel briquettes, etc. So far, this kind of energy has not been found appropriately applied in the Ukrainian energy market due to the lack of technical specifications and regulations for the production, storage, use, but technological developments and equipment of Ukrainian producers are widely sought after abroad.

Ukraine has its own development and industrial production of wind power plants (VEU), but low technical and economic efficiency still does not allow to compete with traditional types of energy. It is necessary to increase the capacity of the wind turbine and attract private capital for investing in wind power.

There are sufficiently favorable conditions for the use of solar energy in Ukraine. The most widespread use of solar energy has been found in heat supply systems. They serve for hot water supply, heating and other needs, which significantly reduces the use of traditional fuel resources. Solar power engineering in Ukraine has been developing quite recently (since 2010), and the potential has steppe areas. However, the main problem is the high cost of photovoltaic cells, most of which are exported. Ukraine has a significant potential for using small river resources, accounting for almost 28% of the total hydropotential of all the years of Ukraine. In particular, it will solve the problems of energy supply in remote and hard-to-reach areas of the countryside. The main advantages of small hydroelectric power stations are relative ease of construction and high ecological compatibility, which do not require the presence of large reservoirs, it is also possible to operate them in a fully automatic mode without permanent staff. Small hydro power plants can become a powerful basis for energy supply for all regions of Western Ukraine; according to scientists, the rapid flooding of the Carpathian Mountains is able to meet the region's demand for electricity by about 15%, and for some regions of the Transcarpathian and Chernivtsi regions it is a source of complete energy supply.

In spite of the gradual depletion of fossil fuel reserves, in the next 15-20 years they will remain the main source of the world energy system, as non-traditional sources, at their present level of development, can't become the basis for energy self-sufficiency in the region. The existing potential of traditional fossil and renewable energy resources in Ukraine allows in the near future to significantly increase the growth rates of their use, creating conditions for stimulating investment activity in this area, for example, from leading countries of the world.